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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,505	01/02/2004	Koichiro Tanaka	0756-7244	8690

31780 7590 02/12/2007  
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EXAMINER
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WILCZEWSKI, MARY A

ART UNIT	PAPER NUMBER
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2822

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/749,505

Applicant(s)

TANAKA ET AL.

Examiner

M. Wilczewski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-75 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 and 29-35 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-28 is/are allowed.
- 6) ☒ Claim(s) 36-75 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 02 January 2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

Applicant's election without traverse of the invention of Species II, claims 10-28 and 36-75, in the reply filed on November 7, 2006, is acknowledged.

Since no arguments were presented traversing the restriction requirement, Applicants' election of the invention of Species II has been treated as an election ***without traverse***.

***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Rejections - 35 USC § 112***

Claims 36-75 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In independent claims 36, 47, 57, and 67, in lines 3-4 of each of the identified claims, there is no antecedence basis for "the non semiconductor film".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 47 and 50-52 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Harkin et al., US Patent 5,705,413.

Harkin et al. disclose a method for manufacturing a semiconductor device which includes the steps of forming a semiconductor film 1 over a substrate 10, see figures 1 and 2 and column 7, lines 22-39; providing a light-shielding film comprising insulating layer 20' and inorganic masking layer 21' with an opening over the semiconductor film, see figures 3, 4, and 5, and column 7, lines 40-67, and column 8, lines 1-8; and irradiating a laser beam to the semiconductor film through the opening of the light-shielding film, see figure 5 and column 8, lines 8-32. Harkin et al. discloses that films 20' and 21' have a combined thickness of 0.3 microns, see column 7, lines 43-44, and column 8, lines 5-7. Hence, the distance between a surface of the light-shielding film in the known method of Harkin et al. and a surface of the semiconductor film is not more than 10 microns (claim 47) or 1 micron (claim 50).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 36, 37, and 39-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harkin et al., US Patent 5, 705,413, in view of Applicants' admitted prior art, shown in figure 1 and disclosed on pages 2-3 of the specification.

Claims 48 and 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harkin et al., US Patent 5,705,413, as applied to claim 47 above, and further in view of Applicants' admitted prior art, shown in figure 1 and disclosed on pages 2-3 of the specification.

Harkin et al. disclose a method for manufacturing a semiconductor device which includes the steps of forming a semiconductor film 1 over a substrate 10, see figures 1 and 2 and column 7, lines 22-39; providing a light-shielding film comprising insulating layer 20' and inorganic masking layer 21' with an opening over the semiconductor film, see figures 3, 4, and 5, and column 7, lines 40-67, and column 8, lines 1-8; and irradiating a laser beam to the semiconductor film through the opening of the light-shielding film, see figure 5 and column 8, lines 8-32. Harkin et al. discloses that films 20' and 21' have a combined thickness of 0.3 microns, see column 7, lines 43-44, and column 8, lines 5-7. Hence, the distance between a surface of the light-shielding film in the known method of Harkin et al. and a surface of the semiconductor film is not more than 10 microns (claim 47) or 1 micron (claim 50). Harkin et al. lack anticipation of relatively moving the substrate during the irradiation step and of using a continuous wave laser having a beam of a linear or elliptical shape.

Harkin et al. disclose that the laser beam is scanned along the substrate, column 6, lines 38-41. However, Applicants disclose that moving the substrate relative to the

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laser beam permits the effective laser annealing of a semiconductor film, see page 2 of the specification. Therefore, it would have been obvious to one skilled in the art to move the substrate relative to the laser beam in the known method of Harkin et al. in order to effectively crystallize the semiconductor film.

Applicants disclose that in crystallization of a semiconductor film, the grain size of a crystal formed in the semiconductor film is larger if a CW laser oscillator is used instead of a pulsed laser oscillator, see page 2 of the specification. When the grain size in the semiconductor film becomes larger, the number of grain boundaries included in a channel region in a TFT formed with the semiconductor film decreases thereby obtaining high mobilities and a high-performance TFT. Therefore, it would have been obvious to use a continuous wave laser in the known method of Harkin et al. The specific continuous wave laser chosen is deemed an obvious design choice given the general teaching of the benefits achieved with the use of continuous wave lasers. Moreover, Applicants have not disclosed that these particular claimed lasers recited in claims 44, 45, 54, and 55 were chosen for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using any continuous wave laser.

In addition, Applicants further disclose that a beam having a linear or elliptical shape is used in the laser annealing of semiconductor films, since the use of a linearly- or elliptically-shaped beam allows the efficient irradiation of the substrate surface and increases the mass-production ability of the annealing process, see page 2 of the specification. Therefore, in order to improve the mass production capability of the

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method of Harkin et al., it would have been obvious to one skilled in the art to use a linearly- or elliptically-shaped beam in the known method of Harkin et al.

### ***Allowable Subject Matter***

Claims 10-28 are allowable over the prior art of record.

Claims 57-75 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Claims 38 and 49 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. However, note that the inclusion of the limitation of claim 38 into claim 36 and the inclusion of claim 49 into claim 47 would result in claims identical to claims 57 and 67, respectively.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additionally cited references disclose the laser annealing of semiconductor films in which a mask is used during the annealing step.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Wilczewski whose telephone number is (571) 272-1849. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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